

## CHECKLIST ENVIRONMENTAL ASSESSMENT

<b>Project Name:</b>	Pine Ridge Salvage Timber Sale
<b>Proposed Implementation Date:</b>	October 2006
<b>Proponent:</b>	Montana Department of Natural Resources and Conservation, Southern Land Office
<b>Location:</b>	Sections 15, 16, and 22 in Township 2 North, Range 31 East; Section 16 in Township 2 N, Range 32 E Sections 16 and 36 in Township 3 N, Range 32 E Section 36 in Township 4 N, Range 32 E Section 36 in Township 4 N, Range 33 E
<b>County:</b>	Yellowstone and Big Horn Counties

### I. TYPE AND PURPOSE OF ACTION

The Southern Land Office (SLO) of the Montana Department of Natural Resources and Conservation (DNRC) is proposing commercial timber harvest within the area burned in July 2006 by the Pine Ridge Complex fires. The proposed harvest area is located approximately 30 miles northeast of Billings, in parts of Sections 15, 16, and 22 in Township 2 North, Range 31 East; Section 16 in Township 2 N, Range 32 E; Sections 16 and 36 in Township 3 N, R 32; Section 36 in Township 4 N, R 32 E; and Section 36 in Township 4 N, Range 33 E (Attachment A, Vicinity Map). The project area (total acreage of these sections) is approximately 5,800 acres. Under the proposed action, DNRC would harvest an estimated 1.9-2.5 million board feet of dead and live ponderosa pine from approximately 1,410 acres. In addition to timber harvest, road maintenance and approximately 8 miles of temporary road building would occur. Temporary spur roads would be reclaimed through moving the berm back onto the road surface, mechanical surface scarification and surface broadcast seeding of native grass species. If the Action Alternative is selected, activities could begin in October 2006. An estimated \$71,250 to \$93,750 in revenue to the Common Schools Trust would be generated through the implementation of the Action Alternative.

The lands involved in this proposed project are held by the State of Montana in trust for the Common Schools (Enabling Act of February 22, 1889; 1972 Montana Constitution, Article X, Section 11). The Board of Land Commissioners and the DNRC are required by law to administer these trust lands to produce the largest measure of reasonable and legitimate return over the long run for the beneficiary institutions (Section 77-1-202, MCA). Specific objectives of the project are to capture timber values at risk of loss and to mitigate adverse environmental impacts of recent fire in terms of restoring a healthy forest and promoting the forest's future income-generating potential.

### II. PROJECT DEVELOPMENT

#### 1. PUBLIC INVOLVEMENT, AGENCIES, GROUPS OR INDIVIDUALS CONTACTED:

*Provide a brief chronology of the scoping and ongoing involvement for this project.*

DNRC sent scoping letters on August 4, 2006 to lessees, adjacent landowners, and other interested parties. A public notice was run in the Billings Gazette from August 5 through August 13. Four written comments and two phone calls were received and used to identify concerns and modify the proposed action. DNRC specialists were also consulted, including: Jeff Schmalenberg, Soil Scientist; Gary Frank, Hydrologist; Patrick Rennie, Archeologist; and Ross Baty, Wildlife Biologist.

#### 2. OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED:

No permits required and no other governmental agencies with jurisdiction.

---

### 3. ALTERNATIVES CONSIDERED:

**No Action:** None of the proposed harvest or roadwork would occur. Current land use activities of grazing and outfitting would continue.

**Timber Harvest Alternative:** Under this alternative, DNRC would continue current uses, and also harvest timber. Approximately 1.9-2.5 million board feet would be harvested from approximately 1410 acres (Attachment B, Proposed Harvest Units and Temporary Roads Map). Within areas of higher burn severity, DNRC would harvest merchantable sized burned trees while leaving trees that had less than 50% of their crown scorched. In the areas of lower burn severity, and in approximately 150 acres of unburned forest within the project area, DNRC would employ an individual tree selection, attempting to reduce stocking levels to emulate historic, pre-fire suppression stand densities while maintaining the stand size and age class structure. Target tree spacing for these stands would range from 30-50 feet depending on existing stocking levels and stand structure. The remaining stands would consist of trees of all size classes favoring trees with good form, crown, and vigor. The harvest activity may require the construction of approximately 8 miles of temporary spur roads and the maintenance and use of existing roads on both state and private land as designated haul routes. All temporary spur roads would be closed and reclaimed upon completion of the sale.

**No Harvest Alternative:** During scoping for the proposed project, one commenter suggested an alternative to carry out only restoration activities, specified as an alternative to remove or fix roads with design flaws. This alternative would not meet the project objective of capturing timber values, and would not be economically feasible to carry out, so it was not studied in detail. However, DNRC shares the concerns about roads and did incorporate road improvements into the action alternative.

---

<b>III. IMPACTS ON THE PHYSICAL ENVIRONMENT</b>
---

---

- |  |
|--|
| <ul style="list-style-type: none"><li>• <i>RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.</i></li><li>• <i>Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.</i></li><li>• <i>Enter "NONE" if no impacts are identified or the resource is not present.</i></li></ul> |
|--|
- 

### 4. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE:

*Consider the presence of fragile, compactable or unstable soils. Identify unusual geologic features. Specify any special reclamation considerations. Identify any cumulative impacts to soils.*

Primary soil and water concerns associated with project activities are sediment delivery to draw bottoms and soil erosion, displacement, and compaction that could result in subsequent loss of site productivity. Potential impacts can be mitigated by locating skid trails properly, minimizing disturbance through directional falling, appropriately timing the season of operation, installing adequate drainage features where needed and timely grass seeding on disturbed areas.

Please refer to Attachment C, Watershed Report.

---

### 5. WATER QUALITY, QUANTITY AND DISTRIBUTION:

*Identify important surface or groundwater resources. Consider the potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality. Identify cumulative effects to water resources.*

Due to the ephemeral nature of the draws and stream channels within the project area, the proposed activities have a low potential to contribute to the degradation of water quality. Primary soil and water concerns associated with this activity are sediment delivery to draw bottoms and soil erosion, displacements and compaction that could result in subsequent loss of site productivity. Potential impacts can be mitigated by locating skid trails properly, minimizing disturbance through directional falling, appropriately timing the season of operation, installing adequate drainage features where needed and timely grass seeding on disturbed areas. Minimal cumulative watershed effects would be associated with the proposed salvage project provided proper mitigation measures and recommendations are met.

Please refer to Attachment C, Watershed Report.

---

## 6. AIR QUALITY:

*What pollutants or particulate would be produced? Identify air quality regulations or zones (e.g. Class I air shed) the project would influence. Identify cumulative effects to air quality.*

---

Under the action alternative, particulate would be released into the atmosphere when the Slash piles are burned. Slash would only be ignited when ambient air conditions are suitable and air dispersal flows are adequate to lift the smoke into the winds aloft for rapid and thorough dispersal. Environmental conditions required prior to ignition must include adequate snow cover on the ground surface with a long-term forecast of continued low temperatures during daylight hours. There would likely be no cumulative impacts on air quality as a result of the proposed action.

---

## 7. VEGETATION COVER, QUANTITY AND QUALITY:

*What changes would the action cause to vegetative communities? Consider rare plants or cover types that would be affected. Identify cumulative effects to vegetation.*

The project area consists of mixed grass and ponderosa pine types. Prior to the fire, approximately 3,800 acres (66%) of the 5,800-acre project area was forested. While 2,860 of those acres had a sawtimber component, with at least 10% crown density of trees greater than 9 inches diameter at breast height (DBH), most (75%) of the stands have poor or medium total stocking. Within the project area, DNRC had harvested approximately 530 acres in the past through two previous timber sales and one timber permit.

At the larger scale, DNRC lands managed by the Southern Land Office are approximately 43% forested, mostly in the ponderosa pine cover type. Like the project area, most of these stands are fairly open with poor or medium stocking. This area falls within climatic section 331G, which was historically 15% forested. Ponderosa pine was the primary species, most commonly in an open savanna type transitioning to grasslands (Losensky, 1997). Over time, conifer encroachment on grass and shrub lands has increased, resulting in the current over-representation of forested types on the landscape. The Pine Ridge Complex fires burned approximately 120,000 acres of private, BLM, and DNRC land.

DNRC has adopted old-growth definitions based on Green et al. (1992). Both prior to the fire and currently, based on number of large live trees, none of the stands in the project area meet the definition of old growth based on Green et al. No recorded threatened, endangered, or sensitive plant species were found in the analysis area (MNHP, 2006). A concern was raised that the area is susceptible to noxious weeds.

**No Action:** No harvest would occur at this time. Compared to the existing condition, no immediate changes would be expected. Over time, natural regeneration would probably establish in some areas. Weed treatment could occur as funding allows.

**Timber Harvest Alternative:** Within areas of higher burn severity, DNRC would harvest merchantable sized burned trees while leaving any trees that had less than 50% of their crown scorched. In the areas of lower burn severity and in 150 acres of unburned forest within the project area, DNRC would employ an individual tree selection harvest that would reduce stocking levels while maintaining the stand size and age class structure.

Changes to the vegetation include an immediate reduction in stocking of trees. The proposed harvest would reduce trees per acre on approximately 1,410 acres, or 33% of the forested portion of the project area. In areas of mixed and low-severity burns, stocking would be reduced and there would be a lower proportion of trees greater than 9" DBH. Decreased live and dead tree density would result in a reduction of wild land fuel hazard, in terms of fuel loading and resistance to control. The general structure and cover type would remain the same. Where available, at least one snag and one snag recruit over 21" DBH would be retained. Over time, ponderosa pine would become established through natural regeneration in areas with a seed source and favorable conditions. At the larger scale, the proposed harvest would reduce stocking on approximately 1% of the area managed by the Southern Land Office.

While the ground disturbing activities associated with the proposed harvest have the potential to introduce or spread noxious weeds, mitigations would be implemented to reduce current infestations and limit the spread of weeds. This would include requiring all road construction and harvest equipment to be cleaned and inspected prior to moving on site, revegetating all newly disturbed soils on road cuts and fills promptly with site adaptive grasses (including native species), and treating weeds along portions of project roads and accessible sites with priority on spot outbreaks of noxious weeds. The proposed action would not be expected to result in direct, indirect, or cumulative adverse impacts on forest vegetation.

---

## **8. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS:**

*Consider substantial habitat values and use of the area by wildlife, birds or fish. Identify cumulative effects to fish and wildlife.*

The project area is currently used by big game, including deer and elk. Silvicultural prescriptions would favor appropriate cover types. Big game may be temporarily displaced during harvest activities but their inherent mobility coupled with surrounding un-harvested areas should provide security and biological needs during the displacement period. Where available, a minimum of one snag and one snag recruit over 21" DBH would be retained as potential nesting and forage sites for birds. If no large snags or trees of that size were present, snags and trees of the next largest size would be substituted. Due to the ephemeral nature of the stream channels and lack of connectedness to the Bighorn and Yellowstone river systems, no fish species are present in the project area. Due to the context and selective nature of the proposed harvest, minimal cumulative effects impacts on terrestrial, avian, and aquatic habitats would be expected as a result of the proposed action.

---

## **9. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES:**

*Consider any federally listed threatened or endangered species or habitat identified in the project area. Determine effects to wetlands. Consider Sensitive Species or Species of special concern. Identify cumulative effects to these species and their habitat.*

There are no known threatened and endangered species in this general area. There are no documented studies suggesting the existence of threatened or endangered species in the project area. Two sensitive species may occur within or near the project area. Potential habitat for the Greater Sage-grouse (*Centrocercus urophasianus*) exists approximately one mile south of the project area. There is no known use of the project area by sage-grouse (FWP, personal comm. 2006). Due to the location of the proposed action, no direct, indirect, or cumulative effects to the Greater Sage-grouse are expected.

Potential habitat for the spotted bat (*Euderma maculatum*) is scattered throughout the 5,800-acre project area. Harvest operations typically do not focus on cliffs and outcrop areas where trees are not present and proposed harvest activities would not affect structural aspects of any cliff or cave like features. The spotted bat habitat specifically identified by the Natural Heritage Program (MNHP, 2006) includes all of Section 36 of T 4N, R 32E. Field review did not identify caves, but there are scattered outcrops and cliffs. In this section, harvest would occur on fewer than 300 acres for less than two months. The other 340 acres of that section would not be disturbed. There is potential risk of disturbance-related impacts to spotted bats should any roost on any of the 1,410 acres proposed for harvest. Due to the type of proposed activities, short duration and season of operations, and considering the abundance of nearby suitable habitat across the project area and surrounding vicinity, low risk of direct, indirect, or cumulative effects to spotted bats is expected.

Black-backed woodpeckers utilize recently burned areas. The Pine Ridge Complex fires burned approximately 120,000 acres, of which approximately 5,800 are within the project area. Approximately 1260 burned acres are proposed for harvesting under the action alternative. Of burned, forested DNRC land within the project area, approximately 63% of the area would remain unharvested. Due to the retention of these areas, and considering the surrounding burned acreage, minimal effects to black-backed woodpeckers would be expected.

There are no limited environmental resources within this area. The timing, context, and selective nature of the sale would create no cumulative impacts as a result of the proposed activity.

Refer to Attachment D, Southern Land Office Checklist for Threatened, Endangered, and Sensitive Species.

---

## **10. HISTORICAL AND ARCHAEOLOGICAL SITES:**

*Identify and determine effects to historical, archaeological or paleontological resources.*

No known Heritage Properties are located on any of the state parcels in the project area.

---

## **11. AESTHETICS:**

*Determine if the project is located on a prominent topographic feature, or may be visible from populated or scenic areas. What level of noise, light or visual change would be produced? Identify cumulative effects to aesthetics.*

The proposed sale area is not visible from any populated or scenic areas. Within the project area, harvested stands would look more open with fewer trees per acre. The proposed project would be expected to have a low risk of negatively affecting the aesthetic quality of the area. Some noise from harvesting equipment and log hauling may be heard within the project area and on haul routes. This is expected to be short in duration and temporary. Due to the location, the relatively small area and the short duration of the proposed project, there would be no measurable cumulative effects on aesthetics.

---

**12. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY:**

*Determine the amount of limited resources the project would require. Identify other activities nearby that the project would affect. Identify cumulative effects to environmental resources.*

No impacts are likely to occur under either alternative.

---

**13. OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA:**

*List other studies, plans or projects on this tract. Determine cumulative impacts likely to occur as a result of current private, state or federal actions in the analysis area, and from future proposed state actions in the analysis area that are under MEPA review (scoped) or permitting review by any state agency.*

Past timber sales in the project area include the 1992 Pine Ridge Timber Sale in sections 15, 16, and 22, T2N, R31E and the 1993 Kaiser Creek Timber Sale in section 36, T3N, R31E. Both sales consisted of selection harvesting to promote uneven-aged ponderosa pine stands. In 2003, one timber permit for 60 MBF was sold and harvested in section 16, T2N, R32E, also a selection harvest. These previous harvests occurred on approximately 530 acres. All harvests promoted appropriate cover types for the area and included mitigations to minimize environmental impacts. There are no known recent timber harvests on the other ownerships within the project area. Due to these characteristics and the relatively small size of these projects, no cumulative impacts would be likely.

---

IV. IMPACTS ON THE HUMAN POPULATION
<ul style="list-style-type: none"><li>• <i>RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.</i></li><li>• <i>Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.</i></li><li>• <i>Enter "NONE" if no impacts are identified or the resource is not present.</i></li></ul>

---



---

**14. HUMAN HEALTH AND SAFETY:**

*Identify any health and safety risks posed by the project.*

Human health would not be impacted by the proposed timber sale or associated activity. Safety considerations and temporary risks would increase for the professional contractors working within the sale area, and possibly for public vehicle traffic on roads while log trucks are hauling. There are no unusual safety considerations associated with the proposed timber sale. The general public and local residents would not face increased health or long term safety hazards because of the proposed timber sale.

---

**15. INDUSTRIAL, COMMERCIAL AND AGRICULTURE ACTIVITIES AND PRODUCTION:**

*Identify how the project would add to or alter these activities.*

All of the sections are currently leased for grazing, and the recent fire temporarily reduced forage available. Over time, forage production would be expected to increase under either alternative.

---

**16. QUANTITY AND DISTRIBUTION OF EMPLOYMENT:**

*Estimate the number of jobs the project would create, move or eliminate. Identify cumulative effects to the employment market.*

People are currently employed in the wood products industry in the region. Due to the relatively small size of the timber sale, there would be no measurable cumulative impact from this proposed action on employment.

---

**17. LOCAL AND STATE TAX BASE AND TAX REVENUES:**

*Estimate tax revenue the project would create or eliminate. Identify cumulative effects to taxes and revenue.*

People are currently paying taxes from the wood products industry in the region. Due to the relatively small size of the timber sale, there would be no measurable cumulative impact from this proposed action on tax revenues.

---

**18. DEMAND FOR GOVERNMENT SERVICES:**

*Estimate increases in traffic and changes to traffic patterns. What changes would be needed to fire protection, police, schools, etc.? Identify cumulative effects of this and other projects on government services*

There would be no measurable cumulative impacts related to demand for government services due to the relatively small size of the timber sale, the short-term impacts to traffic, the small possibility of a few people temporarily relocating to the area, and the lack of other timber sales in the adjacent area.

---

**19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:**

*List State, County, City, USFS, BLM, Tribal, and other zoning or management plans, and identify how they would affect this project.*

The DNRC operates under the State Forest Land Management Plan (SFLMP, DNRC 1996) and Administrative Rules for Forest Management (ARM 36.11.401 through 450, DNRC 2003). The SFLMP established the agency's philosophy for management of forested trust lands. The Administrative Rules provide specific guidance for implementing forest management projects.

---

**20. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES:**

*Identify any wilderness or recreational areas nearby or access routes through this tract. Determine the effects of the project on recreational potential within the tract. Identify cumulative effects to recreational and wilderness activities.*

An outfitter currently holds a special use license for three of the parcels within the project area. The proposed action would not affect this license. Most of the sections do not have public access; hunting is the primarily recreational activity on the parcel that is accessible. There are no wilderness areas in the vicinity. Due to the context and intensity of the proposed action, no measurable effects to access and recreation are expected.

---

**21. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING:**

*Estimate population changes and additional housing the project would require. Identify cumulative effects to population and housing.*

There would be no measurable cumulative impacts related to population and housing due to the relatively small size of the timber sale, and the fact that people are already employed in this occupation in the region.

---

**22. SOCIAL STRUCTURES AND MORES:**

*Identify potential disruption of native or traditional lifestyles or communities.*

No impacts related to social structures and mores would be expected under either alternative.

---

**23. CULTURAL UNIQUENESS AND DIVERSITY:**

*How would the action affect any unique quality of the area?*

No impacts related to cultural uniqueness and diversity would be expected under either alternative.

---

**24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:**

*Estimate the return to the trust. Include appropriate economic analysis. Identify potential future uses for the analysis area other than existing management. Identify cumulative economic and social effects likely to occur as a result of the proposed action.*

**No Action:** Grazing and recreation (special use license for outfitting) on DNRC parcels within the project area would continue to provide annual revenues of \$7,414.00 and \$312.75, respectively.

**Timber Harvest Alternative:** Revenue from grazing and recreation would continue. The timber harvest would generate additional revenue for the Common Schools Trust. The estimated return to the trust for the proposed harvest is \$71,250 to \$93,750 based on an estimated harvest of 1.9 to 2.5 million board feet and stumpage value of \$37.50 per thousand board feet (\$5.00 per ton). This estimated stumpage is based on comparable sales. Costs related to the administration of the timber sale program are only tracked at the Land Office and Statewide level. DNRC doesn't track project-level costs for individual timber sales. An annual cash flow analysis is conducted on the DNRC forest product sales program. Revenue and costs are calculated by land office and statewide. These revenue-to-cost ratios are a measure of economic efficiency. Based on the 5-year average revenue-to-cost ratio for forest management on the Southern Land Office, the estimated cost to generate this

sale's revenue would be \$25,000 to \$32,895. Costs, revenues, and estimates of return are estimates intended for relative comparison of alternatives. They are not intended to be used as absolute estimates of return.

<b>EA Checklist Prepared By:</b>	<b>Name:</b> Sarah Pierce	<b>Date:</b> August 25, 2006
	<b>Title:</b> Forest Planner, Forest Management Bureau	

## V. FINDING

### 25. ALTERNATIVE SELECTED:

Based on the environmental assessment, I have selected the Action Alternative, Timber Harvest. This alternative best meets the project objectives and programmatic goals of the DNRC. The Action Alternative generates more return to the school trust than the No Action Alternative. The environmental effects of The Action Alternative are acceptable as compared with the No Action Alternative. No major losses in habitat, or unacceptable effects to water or soil would occur under the Action Alternative. The Action Alternative includes activities to address environmental concerns expressed by DNRC staff and the public.

### 26. SIGNIFICANCE OF POTENTIAL IMPACTS:

None of the potential impacts associated with the Pine Ridge Timber Sale would be significant. The Action Alternative incorporates mitigations to minimize effects on wildlife, soil, and hydrology issues. The proposed timber sale is similar to past projects that have occurred in the area. Since the environmental assessment does not identify future actions that are new or unusual, the proposed timber sale is not setting a precedent for a future action with significant impacts. Taken individually and cumulatively, the identified impacts of the proposed timber sale are within threshold limits. Proposed timber sale activities are common practices and none of the project activities are being conducted on important fragile or unique sites. The proposed timber sale conforms to the management philosophy adopted by the DNRC in the SFLMP and Administrative Rules and is in compliance with existing laws, policies, guidelines, and standards applicable to this type of proposed action.

### 27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

☐ EIS      ☐ More Detailed EA      ☒ No Further Analysis

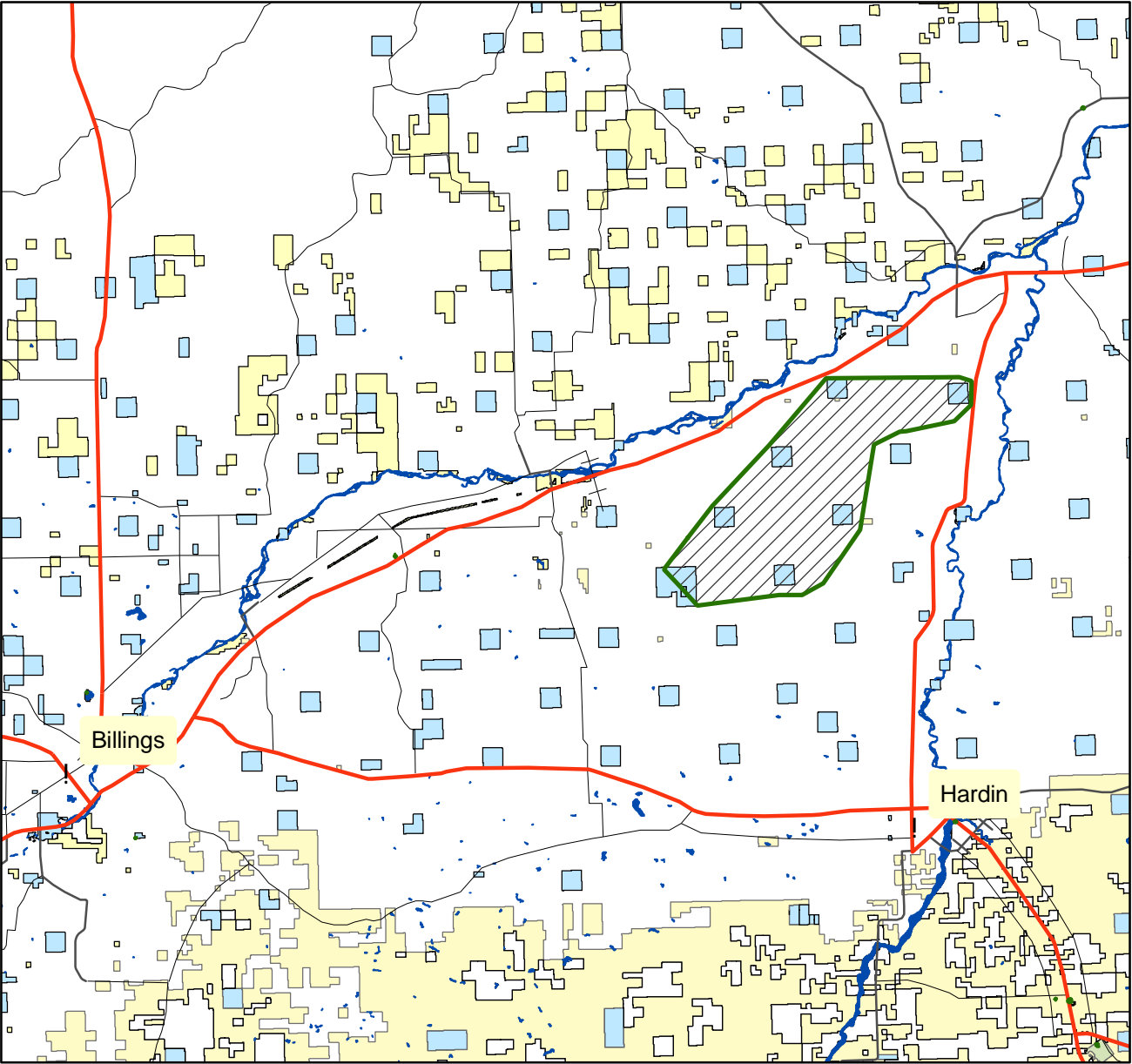
<b>EA Checklist Approved By:</b>	<b>Name:</b> Rick Strohmyer
	<b>Title:</b> Area Manager, Eastern Land Office
<b>Signature:</b> /s/ Rick Strohmyer	<b>Date:</b> August 30, 2006

## References

- Department of Natural Resources and Conservation (DNRC). 1996. State Forest Land Management Plan. Montana DNRC, Forest Management Bureau. Missoula, MT.
- DNRC. 2003. Montana Administrative Rules for Forest Management. Montana DNRC Trust Land Management Division, Forest Management Bureau. Missoula, MT. 87p.
- Graham, R.T., A.E. Harvey, MF Jurgensen, TB Jain, JR Tonn, DS Page-Dumroese. 1994. Managing coarse woody debris in forests of the Rocky Mountain. USDA For. Serv. Int. Mtn. Res. Sta. INT-RP-477. 13pp.
- Green, P., J. Joy, D. Sirucek, W. Hann, A. Zack, and B. Naumann. 1992. Old-Growth Forest Types of the Northern Region. USDA Forest Service, Region 1. Missoula, MT.
- Losensky, J. 1997. Historical vegetation of Montana. Contract #970900. Montana DNRC. Missoula, MT. 109pp.
- Montana Natural Heritage Program (MNHP). 2006. Information on Plant and Animal Species of Special Concern. Report on file at DNRC Forest Management Bureau. Missoula, MT. 10pp.



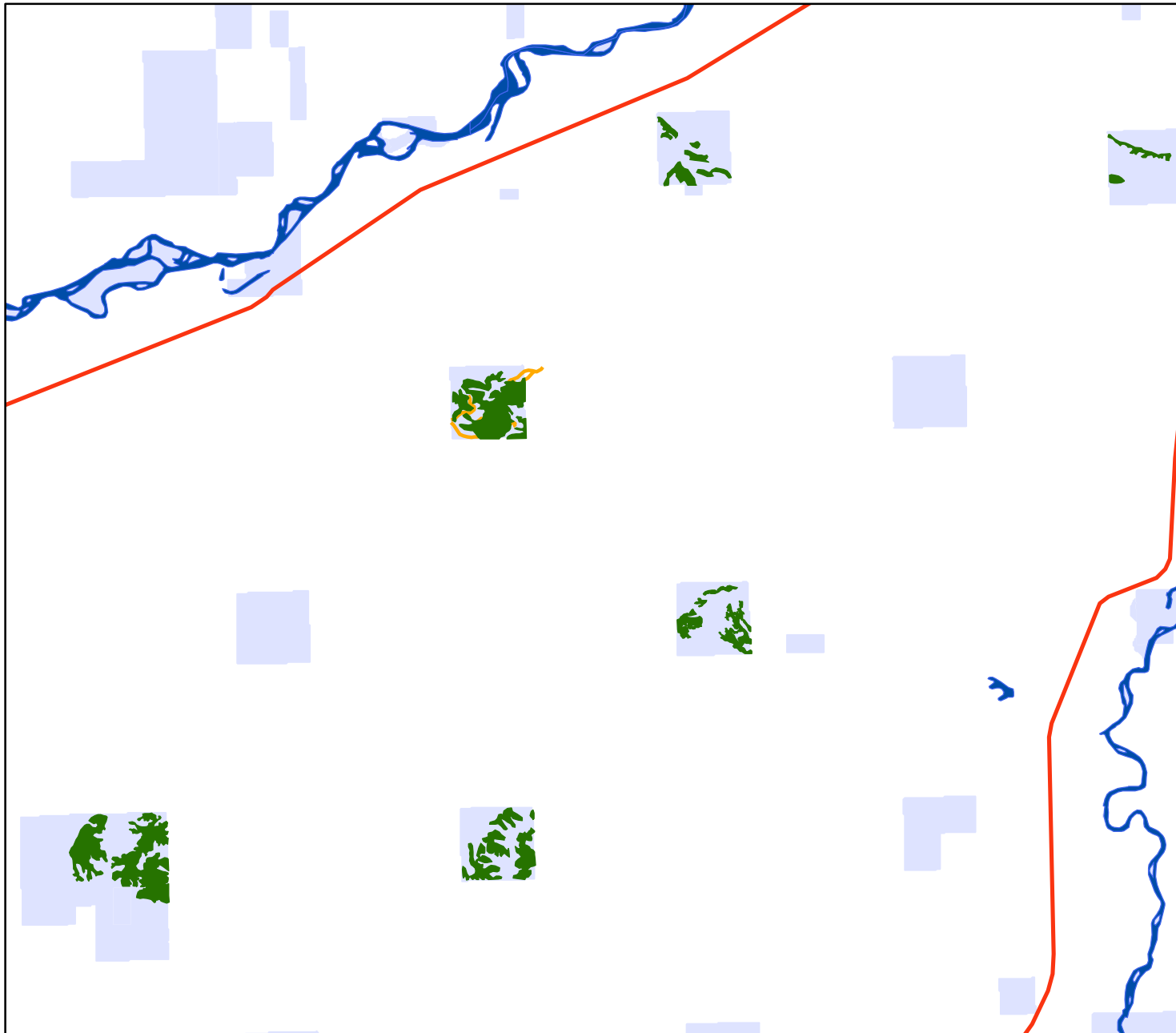
# Pine Ridge Timber Sale Vicinity Map






## Legend

- Project Area
- Major Roads
- Local Roads
- Ownership**
- Other
- BLM
- DNRC
- Fish and Wildlife Service
- Forest Service
- Local Government
- National Park Service
- Native American Lands
- Private
- State of Montana (Other)
- Unknown
- Water

# Pine Ridge Proposed Harvest Unit and Roads Map



## Legend

-  Harvest Units
-  Major Roads
-  Temporary Roads

2

Scale 0 1 2 Miles  
L L L

To: Sarah Pierce, Forest Planner

CC: Gary Frank, Hydrologist, Forest Management Bureau  
Chris Pileski, Forester, SLO

From: Jeff Schmalenberg, Soil Scientist, Forest Management Bureau

Subject: Pine Ridge Salvage Timber Sale Soils/Hydrology Report

Date: August 22, 2006

---

**Existing Conditions/Effects Analysis  
Pine Ridge Salvage Timber Sale  
T 2/3/4N R 31/32/33E Sec's 16 and 36**

**Introduction**

This document includes a soil, water, and fisheries assessment of the Pine Ridge Salvage project area, which includes state owned lands within the 121,210-acre Pine Ridge fire complex. Both existing conditions and effects relating to the proposed activities will be addressed. The following is based on a course filter screening, information gathered during previous entry by DNRC specialists and on-site evaluation of the project area in August 2006.

**Potential Issues**

***Soil/Water Quality:***

Potential issues specific to the Pine Ridge project area are increased sediment delivery to streams and ephemeral draw bottoms, and soil erosion, displacement, and compaction. All of these impacts cumulatively effect soil productivity. Observed burn severity within the project area ranged from low intensity ground fire to complete stand replacement. Areas of high burn severity are expected to have increased erosion, decreased organic inputs and ultimately impact soil productivity. Modification of standing vegetation and consumption of organic matter are the most significant indirect effects of fire on soils (DeBano et al. 1976). Hydrologic issues in the project area related to the post-fire environment would include altered hydrograph components such as decreased response time, larger peak flows, and increased water yield on both event and annual time scales.

***Cumulative Watershed Effects:***

Cumulative watershed impacts can be characterized as impacts on watershed resources that result from the interaction of disturbances, both natural and human caused. The

compounding effects of wildfire, suppression impacts and salvage timber harvesting can exacerbate soil erosion processes, increase runoff response, water yield, and peak flows. Impacts from prior entries were not observed during site reconnaissance and are assumed ameliorated.

### **Affected Environment**

#### *Hydrologic Setting:*

The proposed salvage includes approximately 10 sections of state owned land largely surrounded by privately held ranches. All catchments within the project area are northwest or southeast orientated watersheds and drain infrequently connected channels to the Yellowstone or Bighorn rivers respectively. Precipitation ranges from 13 to 18 inches per year, most of which falls in late spring and early summer as rain. While the morphology of the area is consistent with a flashy hydrologic regime with highly incised draws and channels, most 2<sup>nd</sup> and 3<sup>rd</sup> order catchments in the project area infrequently support minor surface flows for short durations. Most sediment transport and scouring within these ephemeral draws and channels occur during low recurrence interval, convective thunderstorms events when precipitation exceeded the infiltration capacity of the soil.

#### *Fisheries:*

Due to the ephemeral nature of the stream channels and lack of connectedness to the Bighorn and Yellowstone river systems, no fish species are present in the project area.

#### *Soils:*

The geology within the project area is dominated by highly weathered upper Cretaceous sandstone of the Hell Creek Formation. This Mesozoic sedimentary rock of marine origin consists of interbedded dark-gray sandy shale and sandstone and olive-gray shale. This poorly outcropped formation is mantled with unglaciated alluvium deposited from remnant Pleistocene stream channels.

Soils on forested, state owned lands within the project area are dominantly Thedalund-Clapper complex. The complex is composed of the Thedalund loam (40-70%), Clapper gravelly loam (10-30%) and the Midway silty clay loam (10-30%) along with minor rock and shale outcrops. These soils can typically be found on undulating to very steep terrain with slopes ranging between 4 and 90%. They are moderately deep, well-drained soils found in sedimentary upland environments. These soils formed in material weathered in place from shale found in the upper Montana Group. Run-off is very rapid with severe hazard for erosion.

## **Existing Conditions**

### *Soils/Water Quality:*

Private, state and county road systems access all of the sections within the Pine Ridge Project area. Most roads were constructed at minimum design standards and will facilitate hauling while maintaining adequate road surface drainage. One segment of concern is a portion of a county road accessing sections 15, 16 and 22 in T 2N R 31E. Due to the volume of timber to be salvaged from these sections and the amount of hauling required, this segment will need to be regarded along with proper BMP applications to adequately facilitate road surface drainage and increase trafficability.

The primary water quality concerns within the project area is turbidity during high precipitation rain events. No water bodies in the project area are 303(d) listed and are suitable for a wide range of beneficial uses.

The range of burn severity within the project area lends itself to high spatial variability of hydrophobic soils within the landscape. Field results showed signs of hydrophobic conditions and were presumed to be fire induced, but naturally dry August conditions could possibly have second order controls on these observations.

### *Cumulative Watershed Effects:*

Past management activities within the project area include grazing, road construction, timber harvest, water resource development and fire suppression. DNRC has administered two previous timber sales within the project area, most recent being the Pine Ridge timber sale in 1999 and Kasier Creek timber sale in 1993.

## **Environmental Consequences**

### *Soils/Water Quality:*

Due to the ephemeral nature of the draws and stream channels within the project area, the proposed activities have a low potential to contribute to the degradation of water quality. Primary soil and water concerns associated with this activity are sediment delivery to draw bottoms, soil erosion, displacement and compaction resulting in subsequent loss of site productivity. These potential impacts can be mitigated by proper skid trail location and operations planning, minimizing disturbance through directional falling, proper season of operation, installing adequate drainage features where needed and timely grass seeding on disturbed areas.

Minimal temporary roads and crossings will need to be constructed to gain access to section 16 T3N R32E within the project area. Draw bottoms will be crossed at the most feasible location with regard to channel incision, fill requirements and functionality. Upon project completion fill material will be removed and crossing reclaimed and seeded to mitigate any adverse effects.

Loss of site productivity can be minimized by retention of large woody debris for shading, sediment retention, organic matter input, and to reduce moisture stress on regeneration. Historical levels of coarse woody debris within these forest systems is difficult to estimate due to range encroachment within the project area, but slash and other organic matter left will undoubtedly be beneficial to post-fire site productivity.

*Cumulative Watershed Effects:*

Minimal cumulative watershed effects are associated with the proposed salvage project provided proper mitigation measures and recommendations are met for the following reasons:

- Low precipitation within the project area.
- No perennial streams.
- No sustained fishery with the project area.
- Proposed improvements to existing access roads will benefit long-term soil and water quality.

**Pine Ridge Salvage Timber Sale Mitigation Recommendations**

*General Road Design*

- Construct drain dips, grade rolls and other drainage features where necessary and practical to insure adequate road surface drainage.
- Temporary road crossings should be minimized and located where minimal ground disturbance is needed to accomplish operation objectives. Fill material will be removed as soon as operations are completed and the site reclaimed to original surface slope and reseeded.
- Limit road use and hauling to dry, frozen or snow covered conditions. Suspend operations **before** rutting occurs.

*Existing Roads*

- Existing road access to sections 15,16, and 22 T2N R31E will be graded to eliminate ruts adequately drain the road surface. This includes BMP applications and installation of necessary drain dips.

*General design and mitigation recommendations for harvest units*

- Plan designated skid trails, landings and operation routes to avoid excess soil disturbance. No equipment will be operated in ephemeral draws or adjacent slopes greater than 35% except where designated crossing were planning by the contract administrator.
- No slash burning in or near areas of concentrated ephemeral flow.
- Have all equipment restriction zones (ERZ) properly marked in all units along deeply incised ephemeral draws.
- Logging operation will be limited to dry, frozen, or snow covered conditions. No activity will be allowed during spring break up (season dependant).

**Appendix A – Literature Cited**

DeBano, L.F., S.M. Savage, and D.M. Hamilton. 1976. The transfer of heat and hydrophobic substances during burning. Soil Science Society of America Journal 40: 779-782.

CHECKLIST FOR ENDANGERED, THREATENED AND SENSITIVE SPECIES  
 Pertains to Section II. 9. of the DS-252 DNRC Environmental Checklist  
 SOUTHERN LAND OFFICE

<b>Threatened and Endangered Species</b>	[Y/N] Potential Impacts and Mitigation Measures N = Not Present or No Impact is Likely to Occur Y = Impacts May Occur (Explain Below)
Bald Eagle ( <i>Haliaeetus leucocephalus</i> ) Habitat: late-successional forest <1 mile from open water	[N] Bald Eagles have not been documented within the proposed project area (MNHP 2006). No large bodies of water or nesting habitat occur on, or within one mile of the proposed project area. No direct, indirect or cumulative effects to Bald Eagles associated with this project are anticipated.
Grizzly Bear ( <i>Ursus arctos</i> ) Habitat: recovery areas, security from human activity	[N] The proposed project area lies outside of any grizzly bear recovery area. The nearest recovery area is the Yellowstone Grizzly Bear Recovery Zone situated approximately 100 miles southwest of the project area. The project area is approximately 80 miles from known grizzly bear distribution (Wittinger 2002). Riparian habitats preferred by bears do not occur in the project area. No increases in risk of bear-human conflicts are expected. Adverse direct, indirect and cumulative impacts to bears as a result of this project are expected to be minimal.
Lynx ( <i>Felis lynx</i> ) Habitat: mosaics--dense sapling and old forest >5,000 ft. elev.	[N] The project area is all under 5,000 ft. elevation and does not contain vegetation types preferred by lynx. No dense sapling or old forest occurs in the project area. Adverse direct, indirect or cumulative impacts to lynx as a result of this project are expected to be minimal.
Gray Wolf ( <i>Canis lupus</i> ) Habitat: ample big game pops, security from human activity	[N] No wolves or wolf packs are known to occur within or near the project area. Activities associated with the proposal are not expected to effect wolves.

<b>DNRC Sensitive Species</b>	[Y/N] Potential Impacts and Mitigation Measures N = Not Present or No Impact is Likely to Occur Y = Impacts May Occur (Explain Below)
Black-Backed Woodpecker ( <i>Picoides arcticus</i> ) Habitat: mature to old burned or beetle-infested forest	[Y] The Pine Ridge Complex fires burned approximately 120,000 acres, of which approximately 5,800 are within the project area. In the project area, approximately 3,800 acres is forested. Of the estimated 3,400 acres of burned, forested DNRC land within the project area, approximately 2,140 acres (63%) would remain unharvested. Habitat potentially usable by black-backed woodpeckers would be harvested, however, risk of measurable direct and indirect effects to black-backed woodpeckers would be low due to the sizable amount of burned over area that would remain unharvested. Due to the retention of these areas, and considering the unharvested burned stands on adjacent ownerships, minimal cumulative effects to black-backed woodpeckers would be expected.
Greater Sage-grouse ( <i>Hicurus</i> ) Habitat: sagebrush semi-desert	[N] No sage grouse are known to occur within the project area (FWP, personal communication, 2006).



	Under the proposed action, preferred sagebrush habitat would not be altered, nor would important breeding sites be altered. Thus, no direct, indirect or cumulative effects to sage grouse would be anticipated.
Harlequin Duck ( <i>Histrionicus histrionicus</i> ) Habitat: white-water streams, boulder and cobble substrates	[N] No harlequin ducks have been documented within or near the project area (MNHP 2006). No high gradient streams suitable for use by harlequins occur within the project area or cumulative effects analysis area. No direct, indirect or cumulative effects to harlequin ducks would be expected to occur as a result of the proposed action.
Mountain Plover ( <i>Charadrius montanus</i> ) Habitat: short-grass prairie, alkaline flats, prairie dog towns	[N] Mountain plovers have not been documented within or near the project area (MNHP 2006). No short-grass prairie or prairie dog towns occur on, or within one mile of the project area. No direct, indirect or cumulative effects to mountain plovers are expected as a result of this project.
Spotted Bat ( <i>Euderma maculatum</i> ) Habitat: rock outcrops, cliffs, caves, old mines	[Y] Potential habitat for the spotted bat ( <i>Euderma maculatum</i> ) is scattered throughout the 5,800-acre project area. Harvest operations typically do not focus on cliffs and outcrop areas where trees are not present and proposed harvest activities would not affect structural aspects of any cliff or cave like features. The spotted bat habitat specifically identified by the Natural Heritage Program (MNHP, 2006) includes all of Section 36 of T 4N, R 32E. Field review did not identify caves, but there are scattered outcrops and cliffs. In this section, harvest would occur on fewer than 300 acres for less than two months. The other 340 acres of that section would not be disturbed. There is potential risk of disturbance-related impacts to spotted bats should any roost on any of the 1,410 acres proposed for harvest. Due to the type of proposed activities, short duration and season of operations, and considering the abundance of nearby suitable habitat across the project area and surrounding vicinity, low risk of direct, indirect, or cumulative effects to spotted bats is expected.
Townsend's Big-Eared Bat ( <i>Plecotus townsendii</i> ) Habitat: caves, caverns, old mines	[N] DNRC is unaware of any mines or caves within the project area or close vicinity that would be suitable for use by Townsend's big-eared bats. Thus, no direct, indirect or cumulative effects to Townsend's big-eared bats are anticipated as a result of this project.
White-tailed Prairie Dog ( <i>Cynomys leucurus</i> ) Habitat: mountain meadows, semi-desert grassland	[N] No white-tailed prairie dogs are known to occur within or near the project area. Thus, no direct, indirect or cumulative effects to prairie dogs are expected to occur as a result of this project.
Black-tailed Prairie Dog ( <i>Cynomys ludovicianus</i> ) Habitat: grasslands, short-grass prairie, sagebrush semi-desert	[N] No black-tailed prairie dogs are known to occur within or near the project area. Thus, no direct, indirect or cumulative effects to prairie dogs are expected to occur as a result of this project.
Westslope Cutthroat Trout ( <i>Oncorhynchus clarkii</i> )	[N] No streams occur in or near the project area. No direct, indirect or cumulative effects to westslope

<i>lewisii</i> Habitat: white-water streams, boulder and cobble substrates	cutthroat trout would be expected to occur as a result of the proposed action.
Yellowstone Cutthroat Trout ( <i>Oncorhynchus clarkii bouvieri</i> ) Habitat: white-water streams, boulder and cobble substrates	[N] No streams occur in or near the project area. No direct, indirect or cumulative effects to yellowstone cutthroat trout would be expected to occur as a result of the proposed action.

Pine Ridge Timber Sale  
Wildlife Cumulative Effects Analysis Area

